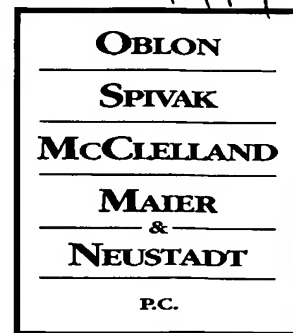




Docket No.: 220952US0PCT

COMMISSIONER FOR PATENTS  
ALEXANDRIA, VIRGINIA 22313



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RE: Application Serial No.: 10/089,064

Applicants: Arno LANGE, et al.

Filing Date: April 5, 2002

For: METHOD FOR PRODUCING MANNICH ADDUCTS  
THAT CONTAIN POLYISOBUTYLENE PHENOL

Group Art Unit: 1714

Examiner: TOOMER, CEPHIA D.

SIR:

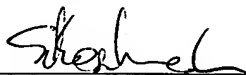
Attached hereto for filing are the following papers:

**Letter to Examiner (2 pp.)**  
**Supplemental Amendment Filed on November 1, 2005 (Copy, 11 pp.)**  
**Date-Stamped Filing Receipt Dated November 1, 2005 (Copy)**

Our check in the amount of \$0.00 is attached covering any required fees. In the event any variance exists between the amount enclosed and the Patent Office charges for filing the above-noted documents, including any fees required under 37 C.F.R. 1.136 for any necessary Extension of Time to make the filing of the attached documents timely, please charge or credit the difference to our Deposit Account No. 15-0030. Further, if these papers are not considered timely filed, then a petition is hereby made under 37 C.F.R. 1.136 for the necessary extension of time. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.  
Norman F. Oblon

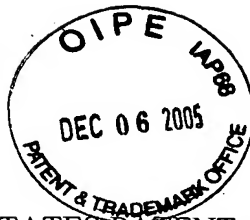
  
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DOCKET NO: 220952US0PCT



IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :  
ARNO LANGE, ET AL. : EXAMINER: TOOMER, CEPHIA D.  
SERIAL NO: 10/089,064 :  
FILED: APRIL 5, 2002 : GROUP ART UNIT: 1714  
FOR: METHOD FOR PRODUCING :  
MANNICH ADDUCTS THAT CONTAIN  
POLYISOBUTYLENE PHENOL

LETTER TO THE EXAMINER

COMMISSIONER FOR PATENTS  
ALEXANDRIA, VIRGINIA 22313

SIR:

Responsive to the Office Communication of November 10, 2005, Applicants provide herewith a copy of a date-stamped filing receipt evidencing the submission of a Supplemental Amendment in the above-identified application on November 1, 2005. A copy of the Supplemental Amendment filed on November 1, 2005 is attached.

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The Supplemental Amendment corrected a typographical error in Claim 1.

The Office Communication of November 10, 2005 objected to the Amendment filed on August 29, 2005 on the grounds that the Amendment was not fully responsive (i.e., because Claim 1 contained a typographical error and was incomplete). Applicants submit that the Supplemental Amendment filed on November 1, 2005 corrected the typographical error which is the basis of the Office Communication of November 10, 2005.

Therefore, the Office Communication of November 10, 2005 is moot.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.  
Norman F. Oblon



---

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(OSMMN 06/04)

NFO/SUK:sjh



**COPY**

DOCKET NO: 220952US0PCT

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :  
ARNO LANGE, ET AL. : EXAMINER: C. TOOMER  
SERIAL NO: 10/089,064 :  
FILED: APRIL 5, 2002 : GROUP ART UNIT: 1714  
FOR: METHOD FOR PRODUCING :  
MANNICH ADDUCTS THAT CONTAIN  
POLYISOBUTYLENE PHENOL

SUPPLEMENTAL AMENDMENT

COMMISSIONER FOR PATENTS  
ALEXANDRIA, VIRGINIA 22313

SIR:

Further to the Amendment and Request for Reconsideration filed on August 29, 2005,  
in response to a Office Action of March 29, 2005, Applicants respectfully request entry of the  
following amendment.

**Amendments to the Claims** are reflected in the listing of claims which begins on  
page 2 of this paper.

**Basis for the Amendment** begins on page 10 of this paper.

**Remarks** begin on page 11 of this paper.

IN THE CLAIMS

Please amend the claims as follows:

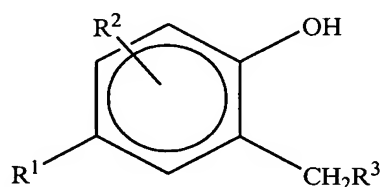
Claim 1 (Currently Amended): A process for the preparation of polyisobutenylphenol-containing Mannich adducts, comprising:

- a) alkylating a phenol with at least one polyisobutene having more than 70 mol % of vinylidene double bonds and a number average molecular weight of from 300 to 3000 at below about 50°C in the presence of an alkylation catalyst;
- b) reacting the reaction product from a) with formaldehyde, an oligomer or a polymer of formaldehyde and at least one amine which has at least one secondary amino function and no primary amino function[[]; or]].

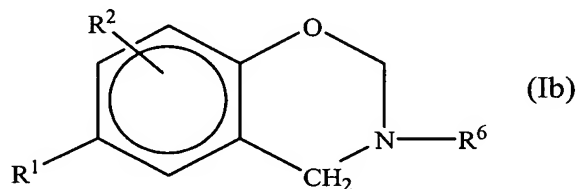
Claim 2 (Canceled).

Claim 3 (Canceled).

Claim 4 (Previously Presented): The process as claimed in Claim 1, wherein an adduct mixture is obtained which comprises at least 40 mol% of compounds of one or more of formula Ia and Ib,



(Ia)



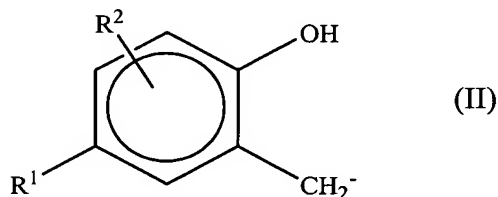
(Ib)

where

R<sup>1</sup> is a terminally bonded polyisobutenyl radical,

$R^2$  is H,  $C_1$ - to  $C_{20}$ -alkyl,  $C_1$ - to  $C_{20}$ -alkoxy, hydroxyl, a polyalkylenyl radical or  $CH_2NR^4R^5$ , where  $R^4$  and  $R^5$  have the meanings stated below, and

$R^3$  is  $NR^4R^5$ , where  $R^4$  and  $R^5$ , independently of one another, are H,  $C_1$ - to  $C_{20}$ -alkyl,  $C_3$ - to  $C_8$ -cycloalkyl and  $C_1$ - to  $C_{20}$ -alkoxy radicals which may be interrupted and/or substituted by N and O heteroatoms, and phenol radicals of the formula II



where  $R^1$  and  $R^2$  are as defined above;

with the proviso that  $R^4$  and  $R^5$  are not simultaneously H or phenol radicals of the formula II; or  $R^4$  and  $R^5$ , together with the N atom to which they are bonded, form a 5-, 6- or 7-membered cyclic structure which has one or two N and O heteroatoms and may be substituted by one, two or three  $C_1$ - to  $C_6$ -alkyl radicals; and

$R^6$  is a radical  $R^4$  or  $R^5$  other than H.

Claim 5 (Previously Presented): The process as claimed in Claim 1, wherein a Mannich adduct having a polydispersity of from 1.1 to 3.5 is obtained.

Claim 6 (Canceled).

Claim 7 (Previously Presented): The process as claimed in Claim 1, further comprising:

fractionating the reaction mixture from b) by column chromatography over an acidic stationary phase by multistage elution with

- at least one hydrocarbon and then
- at least one basic alcohol/water mixture.

Claim 8 (Previously Presented): The process as claimed in claim 7, wherein the basic alcohol/water mixture is a mixture of

- a) from 75 to 99.5% by weight of at least one C<sub>2</sub>- to C<sub>4</sub>-alcohol,
- b) from 0.4 to 24.4% by weight of water, and
- c) from 0.1 to 15% by weight of at least one amine which is volatile at room temperature.

Claim 9 (Previously Presented): The process as claimed in Claim 1, wherein an adduct mixture obtained includes from 0 to 20 mol% of polyisobutenylphenols from reaction step a) which are not reacted further.

Claim 10 (Previously Presented): A Mannich adduct obtained by

- a) alkylation of a phenol with polyisobutene having more than 70 mol % of vinylidene double bonds and a number-average molecular weight of from 300 to 3000 at below about 50°C in the presence of an alkylation catalyst;

b) reaction of the reaction product from a) with formaldehyde, an oligomer or a polymer of formaldehyde and at least one amine which has at least one secondary amino function and no primary amino function.

Claim 11 (Canceled).

Claim 12 (Previously Presented): An additive concentrate, comprising:

one or more to conventional additive components and at least one Mannich adduct as claimed in claim 10 in an amount of from 0.1 to 99.9% by weight.

Claim 13 (Original): A fuel composition containing a main amount of a liquid hydrocarbon fuel and an amount, having detergent activity, of at least one adduct as claimed in claim 10.

Claim 14 (Original): A lubricant composition containing a main amount of a liquid, semisolid or solid lubricant and an amount, having detergent activity, of at least one adduct as claimed in claim 10.

Claim 15 (Canceled).

Claim 16 (Previously Presented): A method of preparing a detergetized fuel or lubricant comprising mixing:

the Mannich adduct of Claim 10 with a fuel or a lubricant.

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Claim 17 (Previously Presented): A method of preparing a detergetized gasoline or diesel fuel comprising:

mixing the Mannich adduct of Claim 10 with a gasoline or a diesel fuel.

Claim 18 (Previously Presented): The process as claimed in Claim 1, wherein an adduct mixture obtained includes from 1-15 mol% of polyisobutenylphenols from reaction step a) which are not reacted further.



Claim 19 (Previously Presented): An additive concentrate comprising: one or more conventional additive components and at least one Mannich adduct as claimed in Claim 10 in an amount of from 0.5-80% by weight.

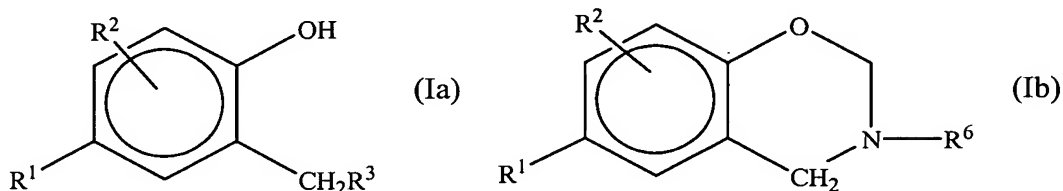
Claim 20 (Previously Presented): A process for the preparation of polyisobutenylphenol-containing Mannich adducts, comprising:

- a) alkylating a phenol with at least one polyisobutene having more than 70 mol % of vinylidene double bonds and a number average molecular weight of from 300 to 3000 at below about 50°C in the presence of an alkylation catalyst; and
- c) reacting the reaction product from a) with at least one adduct of at least one amine which has at least one secondary or primary amino function and formaldehyde, an oligomer of formaldehyde, a polymer of formaldehyde or a formaldehyde equivalent.

Claim 21 (Previously Presented) The process as claimed in claim 20, wherein the amine is at least one selected from the group consisting of 3-(dimethylamino)-n-propylamine, di[3-(dimethylamino)-n-propyl]amine, dimethylamine, diethylamine, di-n-propylamine and morpholine.

Claim 22 (Previously Presented): The process as claimed in claim 20, wherein the adduct is an amination of formaldehyde with a secondary amine selected from the group consisting of di-C<sub>1</sub>-C<sub>8</sub>-alkylamines whose alkyl groups may be substituted by an N(C<sub>1</sub>-C<sub>4</sub>-alkyl)<sub>2</sub> group and cyclic amines which have 4 to 6 carbon atoms and whose cyclic structure may be interrupted by one or more of O and a N-C<sub>1</sub>-C<sub>4</sub>-alkyl group.

Claim 23 (Previously Presented): The process as claimed in Claim 20, wherein an adduct mixture is obtained which comprises at least 40 mol% of compounds of one or more of formula Ia and Ib,

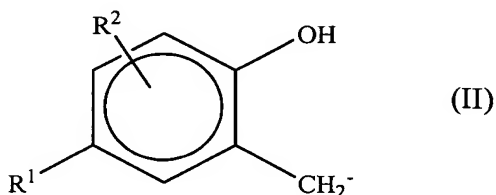


where

$R^1$  is a terminally bonded polyisobutenyl radical,

$R^2$  is H,  $C_1$ - to  $C_{20}$ -alkyl,  $C_1$ - to  $C_{20}$ -alkoxy, hydroxyl, a polyalkylenyl radical or  $CH_2NR^4R^5$ , where  $R^4$  and  $R^5$  have the meanings stated below, and

$R^3$  is  $NR^4R^5$ , where  $R^4$  and  $R^5$ , independently of one another, are H,  $C_1$ - to  $C_{20}$ -alkyl,  $C_3$ - to  $C_8$ -cycloalkyl and  $C_1$ - to  $C_{20}$ -alkoxy radicals which may be interrupted and/or substituted by N and O heteroatoms, and phenol radicals of the formula II



where  $R^1$  and  $R^2$  are as defined above;

with the proviso that  $R^4$  and  $R^5$  are not simultaneously H or phenol radicals of the formula II; or  $R^4$  and  $R^5$ , together with the N atom to which they are bonded, form a 5-, 6- or 7-membered cyclic structure which has one or two N and O heteroatoms and may be substituted by one, two or three  $C_1$ - to  $C_6$ -alkyl radicals; and

$R^6$  is a radical  $R^4$  or  $R^5$  other than H.

Claim 24 (Previously Presented): The process as claimed in Claim 20, wherein a Mannich adduct having a polydispersity of from 1.1 to 3.5 is obtained.

Claim 25 (Previously Presented): The process as claimed in Claim 20, wherein the reaction product from a) is reacted with at least one adduct of an amine and at least one selected from the group consisting of formaldehyde, an oligomer of formaldehyde, a polymer of formaldehyde and a formaldehyde equivalent by reacting the two reactants for at least 15 minutes at above +15°C.

Claim 26 (Previously Presented): The process as claimed in Claim 20, further comprising:

fractionating the reaction mixture from c) by column chromatography over an acidic stationary phase by multistage elution with

- at least one hydrocarbon and then
- at least one basic alcohol/water mixture.

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~~Claim 27 (Previously Presented): The process as claimed in claim 26, wherein the~~  
basic alcohol/water mixture is a mixture of

- a) from 75 to 99.5% by weight of at least one C<sub>2</sub>- to C<sub>4</sub>-alcohol,
- b) from 0.4 to 24.4% by weight of water, and
- c) from 0.1 to 15% by weight of at least one amine which is volatile at room temperature.

Claim 28 (Previously Presented): The process as claimed in Claim 20, wherein an adduct mixture obtained includes from 0 to 20 mol% of polyisobutenylphenols from reaction step a) which are not reacted further.

Claim 29 (Previously Presented): The process as claimed in Claim 20, wherein an adduct mixture obtained includes from 1-15 mol% of polyisobutenylphenols from a) which are not reacted further.

Claim 30 (New): The process as claimed in Claim 4, wherein the adduct mixture comprises a compound of formula Ia wherein  $R^3$  is  $N(CH_3)_2$ .

Claim 31 (New): The process as claimed in Claim 4, wherein the adduct mixture comprises a compound of formula Ia wherein  $R^3$  is  $N(Bu)_2$  and Bu are butyl groups independently selected from the group consisting of n-butyl, iso-butyl, sec-butyl, and tert-butyl.

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~~Claim 32 (New): The process as claimed in Claim 23, wherein the adduct mixture~~  
comprises a compound of formula Ia wherein  $R^3$  is  $N(CH_3)_2$ .

Claim 33 (New): The process as claimed in Claim 23, wherein the adduct mixture comprises a compound of formula Ia wherein  $R^3$  is  $N(Bu)_2$  and Bu are butyl groups independently selected from the group consisting of n-butyl, iso-butyl, sec-butyl, and tert-butyl.

BASIS FOR THE AMENDMENT

Claims 1, 4-5, 7-10, 12-14 and 16-33 are active in the present application. Claims 2-3, 6, 11 and 15 are canceled claims. Claim 1 has been amended to correct an obvious typographical or clerical error. Claims 30-33 are new claims. Support for new Claims 30 and 32 is found in previously presented Claim 4. Support for new Claims 31 and 33 is found in previously presented Claim 4 and on page 9, lines 19-26. No new matter is added.

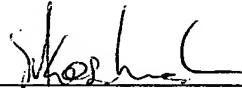
REMARKS

Applicants thank Examiner Toomer for the helpful and courteous discussion of October 31, 2005. During the discussion, Applicants' U.S. representative requested entry of a Supplemental Amendment to add new dependent claims.

Dependent Claims 30-33 are added. New dependent Claims 30-33 require that a specific amine functionality is present in a phenol adduct of formula Ia. Claims 32 and 33 are duplicates of Claims 30 and 31 however dependent from Claim 23 instead of Claim 1.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.  
Norman F. Oblon



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NFO/SUK:sjh



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OSMM&L File No. 220952US0PCT

Dept.: EMICAL

By: ISO/SUK/kh

Serial No. 10/089,064

In the matter of the Application of: Arno LANGE, et al.

For: METHOD FOR PRODUCING MANNICH ADDUCTS THAT CONTAIN  
POLYISOBUTYLENE PHENOL

Due Date: N/A

The following has been received in the U.S. Patent Office on the date stamped hereon:

- ☐ Credit Card Form for \$380.00
- ☐ Dep. Acct. Order Form
- ☐ Transmittal Forms
- ☐ Supplemental Amendment (11 pp.)
- ☐ Opposition Letter in EP 1226188 of August 18, 2005
- ☐ Opposition Letter in EP 1233990 of November 12, 2004
- ☐ Statement of Relevancy
- ☐ Information Disclosure Statement
- ☐ Form PTO-1449
- ☐ Cited References (33)

